

CLAIMS

1. An electric machine which includes a magnetically inducible core and at least two elongated electrical current conductors passing through for each a respective aperture through the core with a first end of a first conductor being at a first side of the core and a first end of a second conductor being at the same said first side of the core, and the two respective first ends being electrically connected together by a bridging member.
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2. An electric machine as in claim 1 wherein a second end of the second conductor is at a second side of the core and a first end of a third conductor is at the first side of the core, and a second end of the third conductor is at the second side of the core, the two respective second ends being electrically connected together by a bridging member.
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3. An electric machine as in claim 2 including a plurality of elongate electrical current conductors passing through for each a respective aperture through the core with a first end of a each conductor being at a first side of the core and a second end of each conductor being at a second side of the core, wherein each bridging member is adapted to electrically connect the plurality of conductors in pairs such that a single continuous electrically conductive path is formed, running through the core through a plurality of bores.
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4. An electric machine as in claim 1 including at least four elongate electrical current conductors passing through for each a respective bore and two separate bridging members at the first side of the core wherein a first two of the conductors are connected electrically together by a said first of the bridging members and a said second two of the conductors are connected together electrically by a second of the bridging members.
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5. An electric machine as in claim 4 including a plurality of elongate electrical current conductors passing through for each a respective aperture through the core with a first end of a each conductor being at a first side of the core and a second end of each conductor being at a second side of the core, and at least two bridging members at each side of the core, wherein each
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bridging member is adapted to electrically connect the plurality of conductors in pairs such that at least two separate continuous electrically conductive paths are formed, each running through the core through a plurality of bores.

- 5 6. An electric machine as in claim 5 wherein each of the separate electrically conductive paths is connected to a different phase of a multi-phase electrical supply.
7. An electric machine as in any one of the preceding claims wherein the bridging member is a printed circuit board.
- 10 8. An electric machine as in any one of the preceding claims wherein the core is comprised of a soft magnetic composite material.
9. An electric machine as in any one of the preceding claims wherein the core is comprised of high resistance bonded iron.
- 15 10. An electric machine as in any one of the preceding claims wherein each of the said elongated electrical conductors is a physically straight member that is located within a correspondingly straight bore through the core.
- 20 11. An electric machine as in any one of the preceding claims wherein each of the electrical current conductors has an electrically insulating coating located so as to extend around its outer side at least where it is in an adjacent or adjoining relationship with the inner surface of the bore through which it is located.
12. An electric machine as in any one of the preceding claims wherein the insulation is an enamel coating.
- 25 13. An electric machine as in any one of the preceding claims wherein each of the elongate electrical current conductors is located within a bore passing fully through the core and is of a matching cross-sectional shape and size such that the inner dimensions of the bore are close to external dimensions of the outer surface of the elongate electrical conductor.

14. An electric machine as in any one of the preceding claims wherein the bore is coated with an insulating lacquer.
15. An electric machine as in any one of the preceding claims wherein the respective bores are each parallel one with respect to the other.
- 5 16. An electric machine as in any one of the preceding claims wherein any or each of the conductors may pass through one or more of the bridging members without electrical contact thereto such that there are independent electrical contacts with respective electrical circuits.
- 10 17. An electric machine as in any one of the preceding claims wherein the electric machine is an electrical motor.
18. An electric machine as in any one of the preceding claims wherein the electric machine is an electrical generator.
19. An electric machine as in any one of the preceding claims wherein the electric machine is an electrical transformer.
- 15 20. An electric machine as in any one of the preceding claims wherein the electrical machine is a brushless generator or motor wherein the core is arranged to be a stator of the generator or motor.
- 20 21. An electric machine as in any one of the preceding claims wherein the elongate electrical conductor is in each case a wire having an enamel outer insulating coating.
- 25 22. An electric motor having a stator which has a core of a soft magnetic composite material and where there are a plurality of bores passing through the core material and where there is for each of the bores a straight electrical conductor having an outer insulating coating passing fully through its respective bore with a close outer dimensional fit and there being at each end of the electrical conductor a bridging member which is for each respective end connected to other electric conductors.
23. A method of constructing an electric machine which includes the steps of

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passing at least two electrically insulated wires or other elongate conductors through a respective one of at least two bores which pass through a magnetically inducible core, and at least at one of the ends of each conductor are connected together by a bridging member.

5 24. An electrical machine substantially as described in the specification with reference to and as illustrated by any one or more of the accompanying drawings.

10 25. A method of constructing an electric machine substantially as described in the specification with reference to and as illustrated by any one or more of the accompanying drawings.